

Bibliometric Analysis: Management in Early Childhood Education

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Abstract

Management issues in early childhood education institutions can be a complex challenge for administrators and teaching staff. Therefore, understanding topics of interest and expanding shared networks are necessary to advance development research toward a unified effort. In this bibliometric study, our aim was to disseminate global research trends in the field of Early Childhood Education Management based on publication results, co-authorship between authors and country affiliations, and co-occurrence of author keywords. Using the Scopus database, a total of 181 journal articles were taken which were published between 2013 – 2023. The research results show that since 2016, the number of publications has continued to increase so that the accumulated number of articles published to date continues to increase. About 20% of total global publications are contributed by researchers from the United States, leading 30 other countries/regions. The dominant keywords are PAUD and teacher training. Research trends in early childhood education management over the last 10 years show a focus on initial teacher development and training, as well as improving the quality of education through classroom management, professional development, and human resource management.

Keywords: *bibliometric analysis; education management; early childhood education*

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Introduction

Early childhood education institutions, commonly known as PAUD, are educational institutions specifically designed to provide learning experiences for early childhood, namely children in the age range of 0 to 6 years (Alam, 2022; Alan, 2021). The main goal of PAUD institutions is to provide a strong foundation for the holistic development of children from an early age, which includes physical, cognitive, language, social and emotional aspects. Education at this early stage is considered very important because it is a golden period in the development of a child's brain, where their learning abilities are at their peak (Çiftci & Bildiren, 2020). Therefore, PAUD institutions have a crucial role in helping children develop their potential and basic skills to help them succeed (Stone & Bryant, 2019).

In PAUD institutions, the learning approach focuses more on games, exploration, and practical experiences appropriate to early childhood characteristics and developmental levels (Papadakis et al., 2021; Papavlasopoulou et al., 2019). The curriculum structured in PAUD is

designed to provide a fun and interesting learning experience for children so they can learn happily without feeling pressured. Even though early childhood education institutions (PAUD) have an important role in child development, they also face several problems that must be considered and addressed, especially management issues. Management problems in early childhood education institutions (PAUD) can become obstacles to implementing effective and quality education.

Management issues in early childhood education institutions can be a complex challenge for administrators and teaching staff (Sahu, 2020). One of the problems that is often faced is the management of resources, including financial aspects, human resources, and facilities (Ngoc Su et al., 2021). Limited funds can hinder an institution's ability to provide adequate facilities and resources to support the learning process. In addition, recruiting and retaining qualified teaching staff with special competencies in early childhood education is also a concern, bearing in mind the need for specific approaches and skills in teaching young children. Effective classroom management is also challenging because children at this stage tend to have short attention spans and high energy levels (Pertiwi et al., 2020). Using appropriate teaching methods and creating a fun and stimulating learning environment is a concern in the management of early childhood education (Shih, 2020). In addition, involving parents in early childhood education is also important, but communication difficulties or lack of parental participation can sometimes be problematic.

Support and attention from the community and government also affect the smooth operation of early childhood education institutions (Ranta et al., 2023; Ul Hassan et al., 2023). Monitoring and assessing children's development holistically also requires a wise approach to institutional management. With an awareness of this problem, early childhood education institutions can try to overcome these challenges with the cooperation and commitment of all relevant parties to create an optimal and enjoyable learning environment for children's development.

In addition to the management problems previously mentioned, several other aspects are also of concern in early childhood education institutions (Dayal & Tiko, 2020). One of them is the development of a curriculum that fits the needs and characteristics of early childhood. Ensuring a curriculum covering various aspects of child development, such as cognitive, social, emotional, and motor, and following applicable educational standards is a challenge. Aspects of administration and documentation management also should be addressed (Ardoin & Bowers, 2020). Accurate and regular control of data and records is essential for monitoring child development, attendance, and other administrative information. Another challenge in managing early childhood education institutions is ensuring the safety and health of children (Atiles et al., 2021). Institutions must maintain a safe environment, good hygiene, and adherence to health standards to prevent the spread of disease and create a healthy learning environment.

Finally, a management challenge that is no less important is adapting to developments in information technology (Crawford et al., 2021). The use of technology in the learning process and communication with parents is increasingly becoming an important part of early childhood education. Integrating technology appropriately and ensuring its safety is a concern for educational institutions. To overcome this management problem, early childhood education institutions must carry out careful planning, build good cooperation with parents, and continue developing staff and teachers' skills and knowledge (Zhang et al., 2020). With a commitment to improving the quality of early childhood education, institutions can create a supportive and enjoyable learning environment, providing a strong foundation for children's development from an early age.

Therefore, we need to know the problems and other factors related to management in early childhood education; knowing the issues and other factors related to leadership in early childhood education is important. With a deeper understanding of these issues, educational institutions, governments, parents and communities can take appropriate steps to improve the

quality and effectiveness of early childhood education. This study aims to identify publications related to management in early childhood education and describe these studies' characteristics. This study used bibliometric analysis to explore the features of publications on management in early childhood education, the factors associated with these publications, and to analyze the direction of research focus in this field (Muhammad & Yolanda, 2022; Siahaan et al., 2023; Triansyah, Muhammad, et al., 2023; Triansyah, Yanti, et al., 2023). Many have used bibliometric analysis as a method for analyzing published results (Angraini et al., 2022, 2023; Maryanto et al., 2023; Muhammad et al., 2023).

Based on the previous presentation, the researchers assessed the need to conduct a global search of early childhood education management studies using bibliometric studies (Donthu et al., 2021; Phoong et al., 2022). In this study, using the Scopus database to search for data, because Scopus is recognized as the largest database of abstracts and citations from peer-reviewed literature covering various subjects (Md Khudzari et al., 2018). Furthermore, the results of this study can be a means for other researchers who are interested in studying management in education, especially in early childhood education both in the material being taught, teaching staff, curriculum, and classroom management, especially in looking for research gaps.

In this paper, in detail our objectives are as follows: i) to analyze the pattern of the temporal distribution of articles related to management in early childhood education; ii) to demonstrate the contributions of prolific authors, and leading countries; (iii) highlighting general terms and research topics; and (iv) to provide insight into potential collaborations and future directions. This paper will be useful for researchers, policy makers and individuals to understand research trends and to discover potentials and opportunities for future research.

Methodology

Bibliometric analysis studies are methods used to mechanically analyze global research trends in a field based on publications in academic literature databases. This approach differentiates a bibliometric analysis paper from a review paper, which is more focused on discussing the latest developments, challenges, and future directions of a topic.

Data search was carried out on July 29, 2023 using the Scopus database. The main theme in this research is research articles that contain "management" OR "education management" in the title, abstract and keywords so that the search results are more specific, the researcher only focuses on this main theme in early childhood education. In perfecting the data obtained from the Scopus database, this research uses the PRISM method, which starts with identification, screening, eligibility and inclusion (Moher et al., 2009).

First, identification was carried out by entering the keywords "education management" and "early childhood education" so that 442 data were obtained at this stage. Next, the screening stage was carried out, namely by selecting documents that were only on social science subjects so that 244 data were obtained at this stage. The third stage, namely eligibility, means that the researcher only included articles in English and in the form of documents/articles only so that 181 data were obtained at this stage. In the final stage, namely inclusion by entering the 181 data in the further analysis stage.

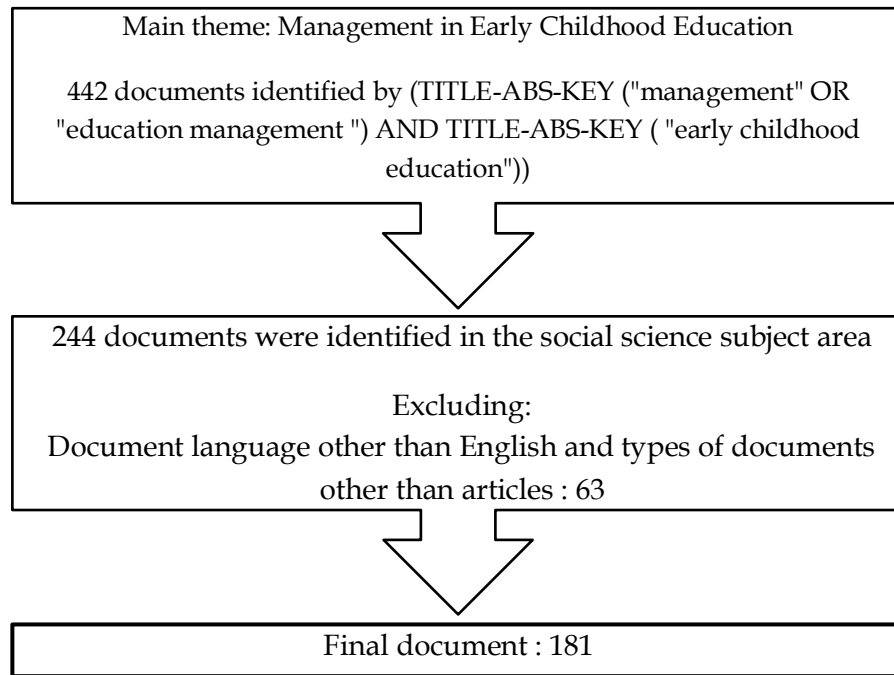


Figure 1. Flowchart of main theme publication data collection

Citations, bibliography, and author keyword information from 181 articles were exported to VOSviewer, a software tool for creating and visualizing bibliometric maps. Maps created using VOSviewer include various items. In this study, the items are the object of interest, namely the country or the author's keywords. Between any pair of items there can be a connection link or relationship between the two items. Each link has a power, represented by a positive numeric value. The higher the value, the stronger the relationship. In the case of the co-authorship analysis, the strength of the relationship between countries indicates the number of publications affiliated with the two countries have co-authored, whereas the total strength of links indicates the total strength of the co-authorship links of a particular country with other countries. Similarly, in the case of co-occurrence analysis, the link strength between author keywords indicates the number of publications in which the two keywords appear together. Details about VOSviewer features can be found in the user manual (Eck & Waltman, 2010).

In our co-authoring analysis, we included 30 countries with a minimum of 2 publications per country affiliated with more than 150 authors. Affiliated countries/regions are grouped into 5 continents: Africa, America, Asia, Europe and Australia.

Author keywords (not Scopus indexed keywords) involve 847 keywords from 181 articles. When using the VOSviewer application, the minimum occurrence of the keywords to be analyzed is set to 3. Network and overlay visualization modes are selected to view research clusters and the average year of publication, number of occurrences and link strength of keywords. In the network visualization, the color of the keywords shows research clusters, while in the overlay visualization, the color of the keywords shows the average publication year of documents that contain shared keywords.

Result and Discussion

Publication output and growth in research interest

Over the past decade, a total of 181 research articles have been published (Fig. 2). The oldest publication of the 181 articles is in 2013 (Irvine & Farrell, 2013; Powell, 2013; Silva & Souza, 2013) and continues to record publications every year thereafter exceeding 10 articles except for 2015. The strong interest in research related to this field started in 2016 which consistently continues to increase the number of publications every year. In

2016, the annual growth rate (AGR) increased by 59%. Since then, annual publications have steadily increased, resulting in a rapid increase in the cumulative published total. Therefore, it is expected that the annual publication will continue to increase. However, most of these articles are not available for free and users have to pay to access the information in them. We suggest that an article is likely to receive more citations if it is published through an open access journal. As of 2015 there are no published articles as open access type.

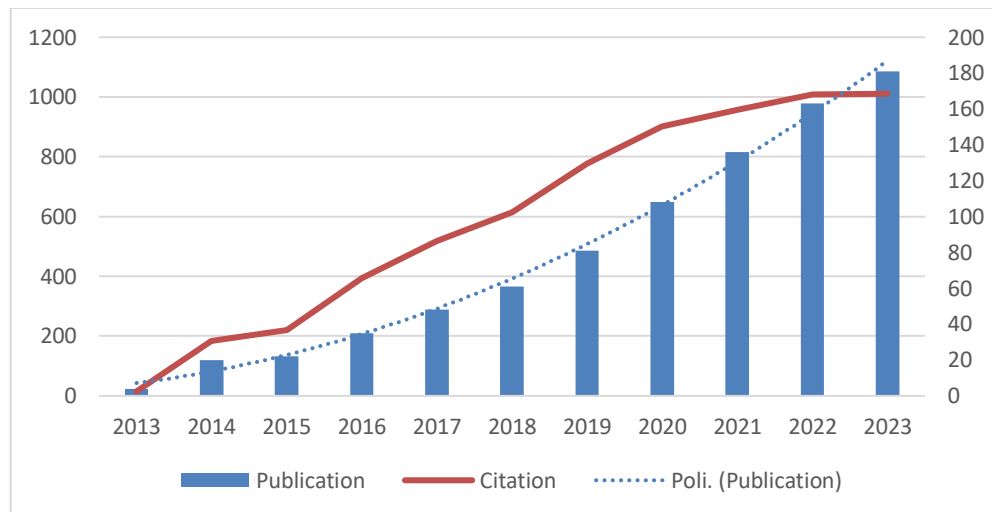


Figure 2. Cumulative Number of Publications and Citations

The research area in Management in Early Childhood Education is vast and many research groups around the world are actively working in this area. Analysis of study areas shows that the subject area of Social Sciences is the main focus in the study of Management in Early Childhood Education. This is evidenced by the total number of publications classified in the following subject areas: Social Sciences (181 articles), psychology (93 articles) and medicine (56 articles). Indeed, Management in Early Childhood Education is the study of the management of education directly related to the social sciences. (Rivas et al., 2023) demonstrated the importance of management in producing high-quality early childhood education, including by increasing teachers' sense of efficacy in classroom management, learning strategies, and child involvement.

Preferred journals

The results show that the 4 journals with the most cited articles are owned by two different publishers (Table 1). The top two Journals are published by Taylor & Francis. The journal with the most cited articles is "European Early Childhood Education Research Journal" with 8 publications (4%), with the most cited articles being written by (Gegenfurtner et al., 2020). The article in the Q2 indexed journal on the Scopus database analyzes academic literature and practice reports to find the main causes of inequity in the accessibility of high-quality early childhood education (PAUD). In a systemic perspective, the principles of good practice for increasing the accessibility of PAUD services are presented at three levels that influence each other: the policy level, the level of provision and the level of family outreach. From that analysis as well as from reports on successful inclusive practices, arrived at five quality criteria and made 13 recommendations for policy and practice.

Table 1. journals with most cited articles on Early Childhood Management

Jurnal	TP (%)	TC	Cite Score 2022	The most cited article (reference)	Times cited	Publisher	quartile
European Early Childhood Education Research Journal	8 (4,4%)	75	2,9	Accessibility of early childhood education and care: A state of affairs (Vandenbroeck & Lazzari, 2014)	51	Taylor & Francis	Q2
Journal of Research on Educational Effectiveness,	1 (0,5%)	49	3,4	Experimental Impacts of the "Quality Preschool for Ghana" Interventions on Teacher Professional Well-being, Classroom Quality, and Children's School Readiness (Wolf et al., 2019)	49	Taylor & Francis	Q2
Journal of School Psychology	1 (0,5%)	37	7,5	Child-care chaos and teachers' responsiveness: The indirect associations through teachers' emotion regulation and coping (Jeon et al., 2016)	37	Elsevier	Q1
International Journal of Leadership in Education,	2 (1%)	36	3,1	Directing and facilitating distributed pedagogical leadership: best practices in early childhood education (Bøe & Hognestad, 2017)	36	Taylor & Francis	Q2

The 13 recommendations are as follows: (1) **Public funding**: direct public funding for supply (supply side financing) appears to be more efficient than demand financing. Provision of public services for all and additional cash flows to disadvantaged families appear to be the most effective strategies. (2) **Integrate the education system**: If education services are integrated under one administrative department, they tend to have higher access, especially for the youngest children. (3) **Rights**: Policies that accept that early childhood education is a right for all children produce better results than targeted policies. (4) **Policies**, that regulate parental fees according to income may be easier to circumvent financial constraints, than a voucher system for the poorest. (5) **Quality monitoring**: Centralized system regulation and monitoring of the structural quality of the ECD setting can prevent children from disadvantaged backgrounds from being more frequently found in poor quality services. It would also be helpful if policy makers would undertake more research on this issue. (6) **Democratic decision-making**: pedagogical policies should reflect multiple perspectives on the upbringing, education and care of young children by involving families and local communities. (7) Priority criteria for registration need to be examined carefully because they affect different populations. (8) **Outreach**: PAUD providers must actively engage with marginalized groups that tend to be less visible in the local community. (9) Flexible opening hours for parents who work in difficult conditions. (10) **A diverse workforce**: a workforce that reflects ethnic and cultural minorities sends a message of welcome to minority communities. It also helps to broaden

the team's understanding of respecting diversity. (11) **Inter-agency cooperation:** integrated centers that work together across sectoral and institutional boundaries (eg education, health, housing, adult education) deliver better outcomes, both in the short term by addressing the complex needs of children and families living in difficult conditions and in the long term, by contributing to the regeneration of local communities. (12) **Parental involvement:** Parents need to be heard, meaning staff have paid for the time and are supported to do so. (13) Information that is accessible and meaningful, including multilingual information that relates to concrete questions from various parents.

Leading countries, top institutions, and international collaboration

Figure 3 shows the 30 most productive countries contributing to the growth of Management in Early Childhood Education research activity around the world. About 20% of global publications contributed by the United States indicate that the United States is a key player in the advancement of Management in Early Childhood Education research. The United States is the leading country with 37 publications in a total of 23 journals. Furthermore, Australia with 21 publications is ranked as the second most productive country.

The distribution of countries/regions per region is shown in Figure 4. The closer two countries are located to each other in VOSviewer, the stronger the linkage and the stronger the link between the two countries, the thicker the line. The co-authoring results show that the United States and Australia are the two most affiliated countries, linked to more than 20 countries. This means that the two countries have collaborated with almost all existing countries in publishing articles related to Management in Early Childhood Education. In addition, only researchers in Brazil have collaborated with 1 other country to publish articles.

Additionally, early childhood education in both countries (United States and Australia) is emphasized in government policy, with inclusive and innovative approaches in teaching methods, making them an attractive choice for international researchers. On the other hand, Brazil offers valuable insights through its approach to early childhood education that focuses on play and social experiences. However, Brazil's international research collaboration is limited, perhaps influenced by their official language, Portuguese, as well as unique educational policies. Nevertheless, Brazil continues to make a valuable contribution to understanding variations in early childhood education approaches at the global level.

Country	Documents ▼	Citations	Total link strength
united states	37	329	69
australia	21	126	550
spain	13	68	128
united kingdom	9	57	188
turkey	9	48	18
finland	8	41	299
canada	8	57	125
brazil	8	10	35
norway	7	48	110
china	6	13	233
greece	5	4	166
new zealand	5	20	113
malaysia	5	2	8
sweden	5	16	7
indonesia	5	1	1
italy	4	65	83
chile	4	10	80
ireland	4	8	23
south africa	4	10	9
cyprus	3	13	61
united arab emirates	3	13	36
france	3	4	3
germany	3	64	3
japan	2	22	194
singapore	2	21	193
nigeria	2	7	154
belgium	2	54	97
hong kong	2	18	59
israel	2	0	12
thailand	2	3	1

Figure 3. The top 30 most productive countries in the publication Management in Early Childhood Education

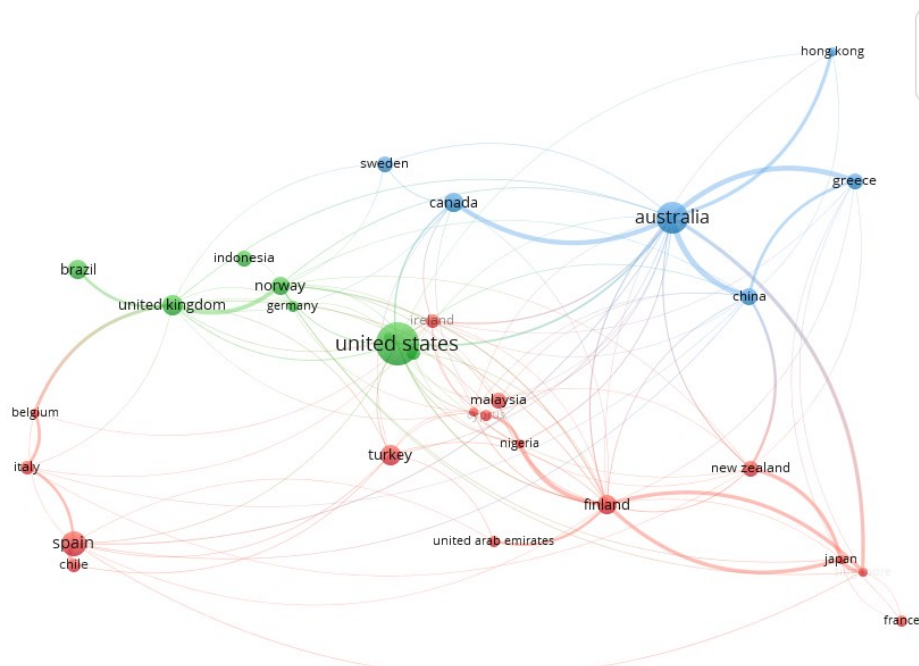


Figure 4. State collaboration

Table 2. List of the 4 most prolific authors in Management in Early Childhood Education research area

Author	Scopus Author ID	Year of 1st publication*	TP	H-index	TC	Curren Affiliation	Country
Zinsser, Katherine M	24777473600	2014 _a	4	4	67	University of Illinois at Chicago	United States
Irvine, Susan	57193934120	2013 _a	3	1	5	Queensland University of Technology National Child Development Research Center, Universiti Pendidikan Sultan, Idris	Australia
Mustafa, Mazlina Che	57209308639	2021 _b	3	0	0	National Child Development Research Center, Universiti Pendidikan Sultan, Idris	Malaysia
Lutovac, Sonja	56258654300	2021 _b	3	0	0	National Child Development Research Center, Universiti Pendidikan Sultan, Idris	Malaysia

* Role in coauthorship, superscript.

_a A first writer.

_b Co-author.

Leading authors

Table 2 lists the 4 most prolific authors, affiliated with the following three countries; Malaysia (2 authors), US (1 author), and South Australia (1 author). First publications ranged from 2013–2021 in which 2 authors served as first author, 2 as co-authors. While there is no specific rule in the order of authorship, the last position is usually associated with seniority and a supervisory role. The author's affiliation indicates that Management in Early Childhood Education's research is in a field related to early childhood education.

Zinsser from the United States leads the list with a record 4 publications since 2014, 4 h-indexes, and 67 citations. We also find that the publication date of 2021 in Table 2 refers to the same article (Saari et al., 2022), written by two prolific authors, Mustafa, Mazlina Che and Lutovac, Sonja from the same country, namely Malaysia, so far there has been The 3 articles they wrote together related to Management in Early Childhood Education. It should be noted that the authors for the most cited articles listed in Table 1 may not necessarily appear in Table 2.

Appearance of Keywords

A total of 168 author keywords were recorded, of which 847 (100%) were used only once, 140 (16%) keywords were used twice, and 71 (8%) were used three times. After re-labeling synonymous single words and congeneric phrases, 21 keywords met the threshold of at least 3 occurrences for mapping in VOSviewer.

Terminologi dan konsep

Our results show that 'Early Childhood Education' was the most frequently encountered keyword with 68 occurrences and 49 links to other keywords (Fig. 5), followed by "Childhood" with 22 occurrences and 48 links to other keywords. We also found use of

common terms such as 'classroom management' (9 events, 18 links). In the context of Management in Early Childhood Education, "classroom management" is an important topic in teacher education, because it has a strong impact on child engagement (Berger et al., 2018; Wallace et al., 2014), as a support for learning in the classroom (Lazarides et al., 2020; Steffensky et al., 2015).

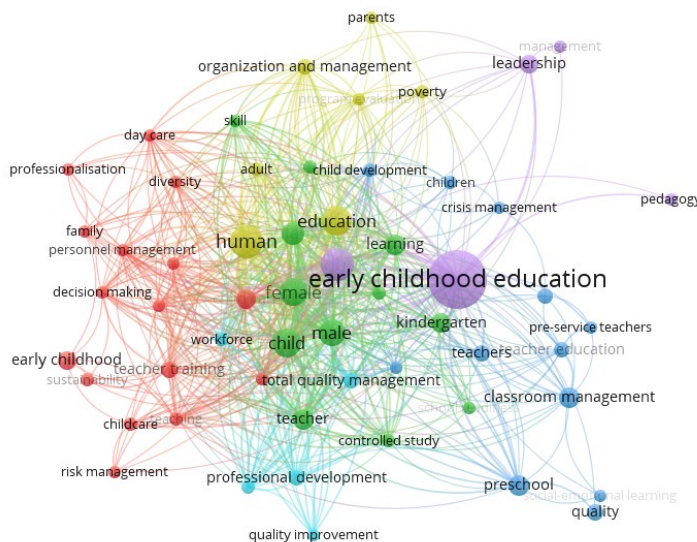


Figure 5. Network Visualitation

Tabel 3. Enam Clusters terkait Management in Early Childhood Education

Clusters (color)	Number of Items	Research focus
1 (Red)	16	Early childhood, dan teachers training
2 (Green)	12	Child, Infant, Teacher
3 (Blue)	12	Classroom Management, and quality
4 (Yellow)	7	Organization and management, human, and education
5 (Purple)	5	Management and Early Childhood Education
6 (Light blue)	5	Quality improvement, and professional developmnet

Recent keywords and linkages between keywords

Figure 6 which shows the use of the new keyword in the light yellow to dark yellow color circle shows the latest developments and research related to this topic. The use of these new keywords indicates a shift in interest and research focus in recent years. This reflects efforts to continue to deepen understanding of the importance of management in early childhood education. New research in this field can bring new implications and a better

understanding of how factors such as teachers training, classroom management affect learning in early childhood. With this research update, we can identify more effective approaches, practices, and interventions to improve the quality of early childhood education.

However, keep in mind that the use of new keywords may also indicate that the topic is still under development and more research is needed to gain a more complete and detailed understanding of this area. In this context, the limitations and weaknesses of previous research may still be relevant and need to be considered in future research. Thus, the presence of new keywords emerging in recent years represents an opportunity for expanding understanding and research in this field. It also provides a stronger foundation on which to build practices and policies that support early childhood education. The keywords with a yellow circle or what we call the new theme are Quality improvement, and professional development, covid 19, and job satisfaction. The new themes also have sufficient density (fig. 7), meaning that not only have they just been researched, but also that many have researched the new themes. For this reason, we need to convey what novelties can be seen apart from the new themes. Linkages between keywords can also create gaps for further research. In figure 8, the main theme of this study, namely Management in Early Childhood Education is not directly connected with the keyword crisis management, children and program evaluation.

Collaboration in writing scientific articles on early childhood education shows a pattern of close connections between certain countries. The United States and Australia are emerging as leaders in this cooperation, connecting with more than 20 other countries. This pattern reflects the importance of international collaboration in early childhood education research, with the United States and Australia serving as centers for coordinating knowledge and research in the field. This conclusion highlights the importance of cross-country exchange of ideas and knowledge in the development of early childhood education

It is important to pay attention to management in early childhood education to avoid crisis management by providing training to teachers regarding crisis management in education. It is also important to give it to parents especially during the Covid 19 pandemic. Research conducted by Kjellgren et al., (2022) on Experience with crisis management when sexual abuse of children is committed by staff in early childhood education: A case study in Sweden , where institutional child sexual abuse is a concern for children, families, and society. Limited research has explored how school leaders and municipal governments handle cases of sexual harassment in educational settings.

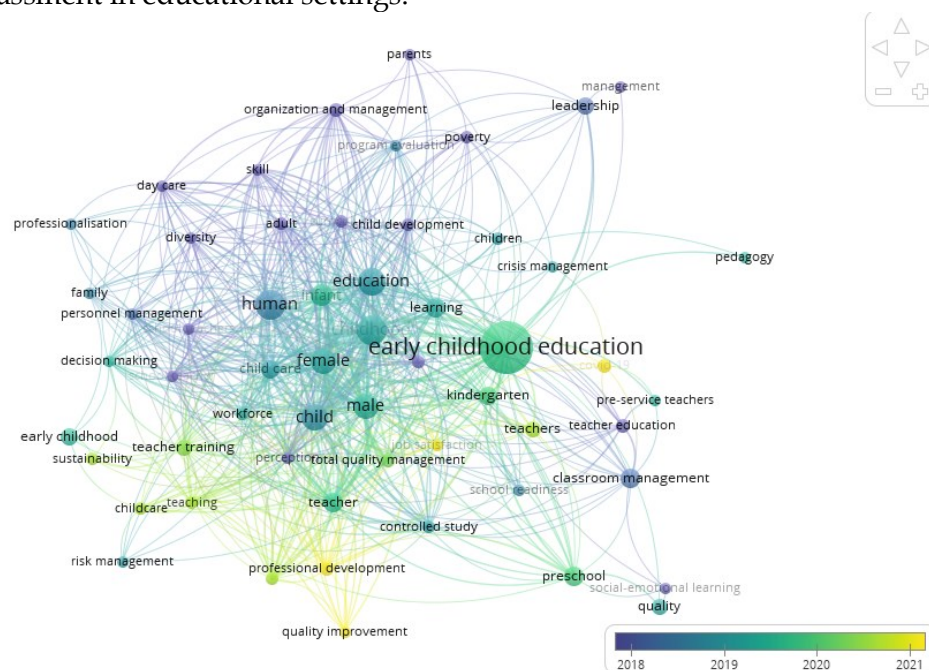
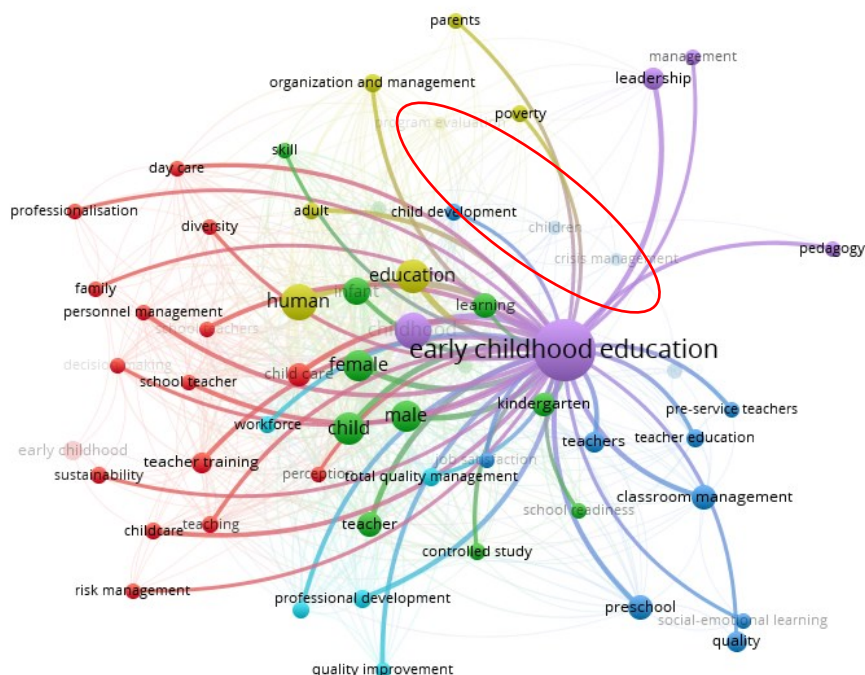
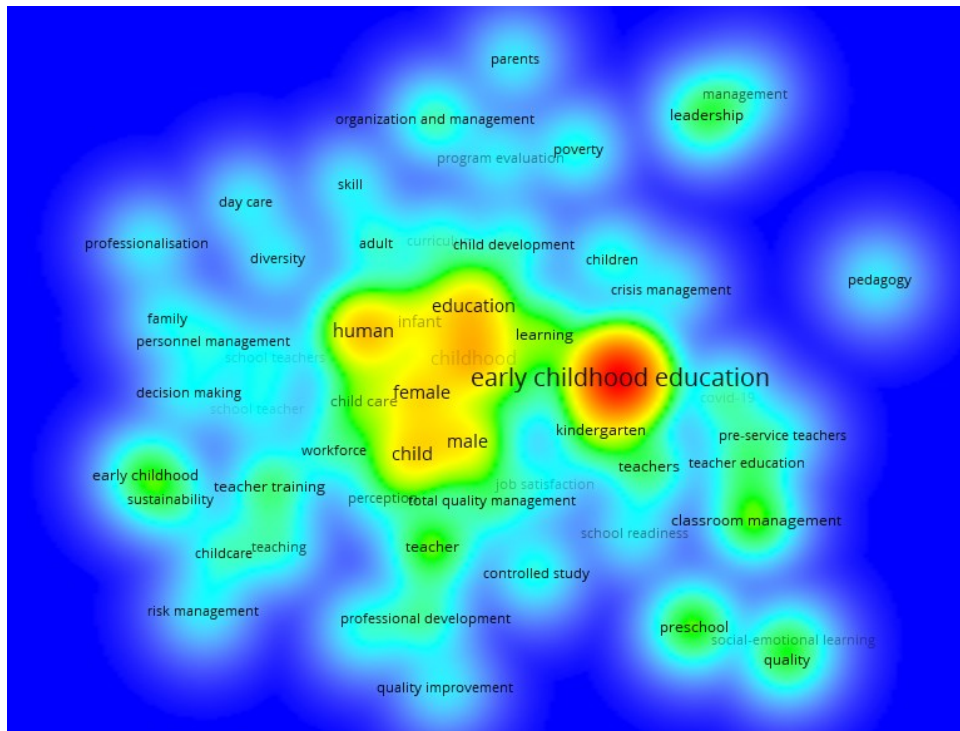


Figure 6. Overlay Visualization



This research has significant implications for understanding educational management in early childhood education. Through bibliometric analysis, this study provides an overall picture of trends, patterns and dynamics in the field, which can serve as a foundation for policy makers, practitioners and academics. The results of this analysis can also contribute to the development of more efficient curricula and teaching methods, as well as the identification of unexplored research areas. However, the limitations of the study also need to be acknowledged. These limitations include the potential for bias arising from the influence of

the sample and database used, the lack of specific contexts that can capture qualitative nuances, challenges in interpreting data without deep expertise, as well as the potential for neglecting research in other languages or cultures if analysis is limited to publications in other languages or cultures. from a certain geographic area. With these limitations in mind, this study nevertheless provides an important and comprehensive view of early childhood education management and offers a solid basis for further research in this area.

Conclusion

This research has provided an overview of the research trends in Management in Early Childhood Education based on 181 publications taken from the Scopus database. The growth of publications has been very rapid since 2016 until the last 2023, and is expected to continue to increase. Zinsser became the most prolific writer regarding early childhood education management. We've found a country/academic institution (US) with a massive number of publications and strong international collaboration. This entity can be an opportunity for researchers from other countries (eg Indonesia) to expand their research collaborations. We have discussed several areas that are currently well explored such as classroom management and teacher training and we have also presented several areas that have recently been investigated with Management in Early Childhood Education Such as Quality improvement, and professional development, covid 19, and job satisfaction which can be a potential hot topic for future study. Not to mention, efforts continue to be made to broaden understanding of management in education, especially in early childhood education and its impact on children's achievements. Further research can explore other factors that affect the quality of early childhood education, such as the 13 recommendations that have been described (Public funding, Integrating education systems, Rights, Quality monitoring, Democratic decision-making, Priority criteria for enrollment, Outreach, Opening hours, Diverse workforce, Inter-agency cooperation, Parental involvement, Accessible information). In addition, it is important to bridge the gap between research and practice. Findings from this research can be integrated into learning approaches to create an inclusive environment, support children in developing abilities, and encourage better achievement. In Indonesia, research on Management in Early Childhood Education is still relatively limited. However, with the rapid developments in this field, there is great potential for Indonesian researchers to contribute and engage in international research collaborations. By working with researchers from other countries who have conducted significant research in this area, Indonesian researchers can broaden understanding and adapt findings in local contexts. Overall, research on Management in Early Childhood Education is an interesting and important area to be explored further.

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